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ROCK CELL

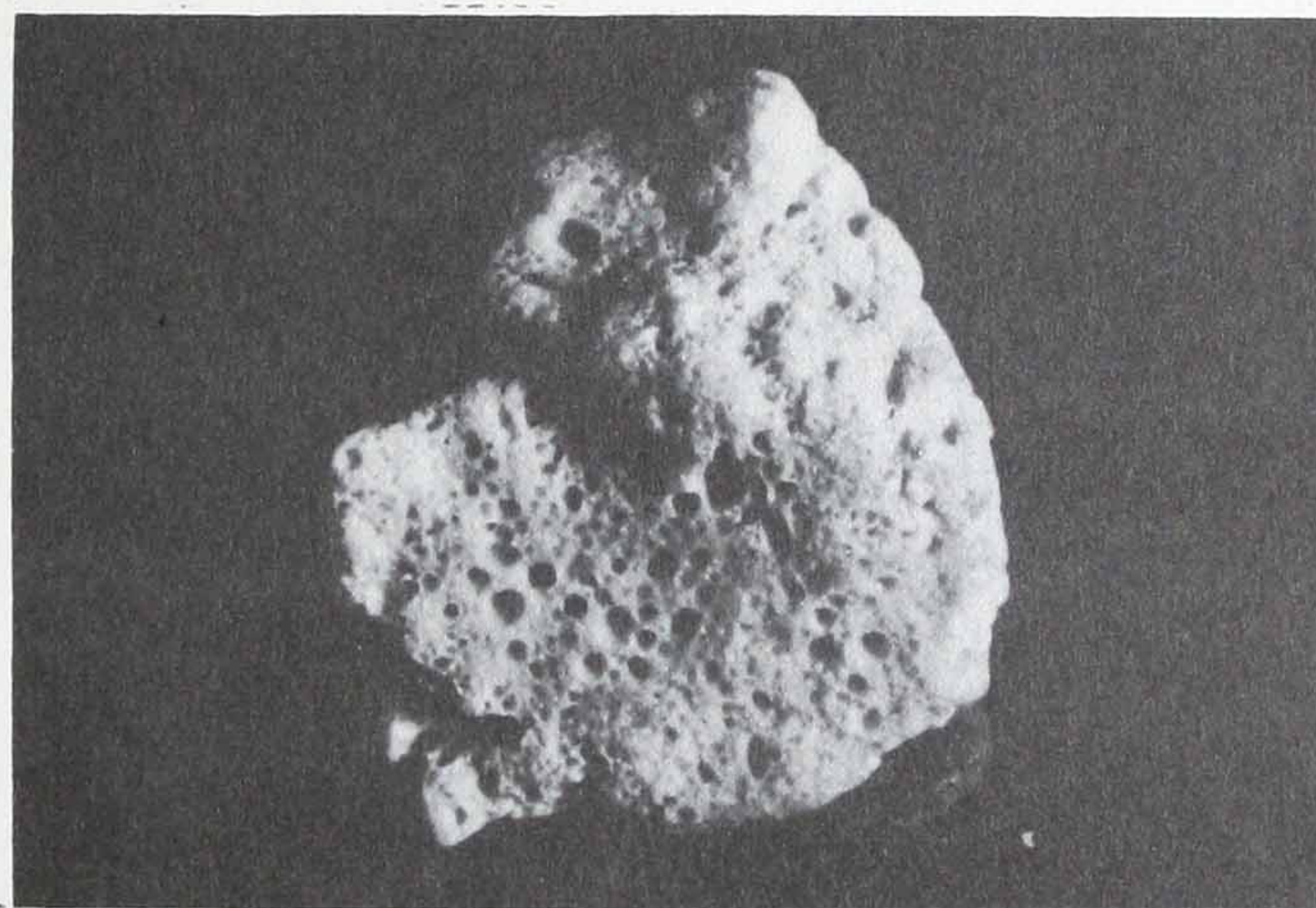
TRADE MARK

THE PERMANENT

INSULATION

INDESTRUCTIBLE

LOW IN COST



WATERPROOF

FIREPROOF

A PIECE OF ROCK CELL ENLARGED FIVE TIMES

ROCK CELL IS A LIGHTWEIGHT STRUCTURE COMPOSED
OF A MASS OF CELLS OF VARIOUS SIZES WHICH
DO NOT INTERCOMMUNICATE

CREATED AT 3000°
FUSION POINT 2325°
NON-ABSORBENT

NON-CORROSIVE
HARD AND STRONG
EASY TO INSTALL

EXCEPTIONAL INSULATING PROPERTIES

ROCK CELL INSULATION COMPANY

105 WEST MADISON STREET, CHICAGO

TELEPHONE STATE 4336

ROCK CELL INSULATION is produced from molten slag that is expanded by being passed through a processing machine in which it is centrifuged and beaten in an atmosphere of steam. This creates a light weight structure composed of a mass of cells of various sizes that do not connect with one another. The cell walls are hard and strong giving it mechanical strength to resist deterioration. The individual pieces are quite irregular in exterior shape and mesh together to form an interlocking layer of insulation.



TYPICAL INTERLOCKING LAYER

ROCK CELL INSULATION is produced in various sizes from 1/16" mesh to as large as 1/2" mesh, and then graded for the most efficient mesh applicable to the particular installation.

ROCK CELL INSULATION is an inert non-absorbent material that is impervious to the deteriorating effects of water-moisture-heat-cold-weather or any of the factors that are destructive to other insulations.

ROCK CELL INSULATION has been submitted to the severest tests known with no impairment whatever. A few are cited:

A cycle of one hundred freezing and thawing tests showed no change in the material. (University of Wisconsin).

Immersion in Sodium Sulphate for a period of 18 hours, and repeated five times, with no increase in number of particles. This test showed this material to be of exceptional soundness, being better than most gravels. (Lewis Institute). This is the final test of U.S. Bureau of Standards to determine stability.

Fusion Point 2325° (Robert W. Hunt & Company).

Has lain exposed to the elements for more than five years with no deterioration or disintegration.

Chemical analysis made by Robert W. Hunt & Company:

Loss on ignition	Gain	Calcium Oxide	44.40%
Silica	34.40%	Sulphur as Sulphate	None found
Iron Oxide	1.60%	Total Sulphur	1.45%
Aluminum Oxide	11.40%	Water soluble Sulphur	None found
Magnesium Oxide	6.22%	Water	None found

The Calcium is definitely combined with other elements and cannot exist as free lime. The Sulphur is very low, all the water soluble Sulphur having been driven off in the manufacturing process.

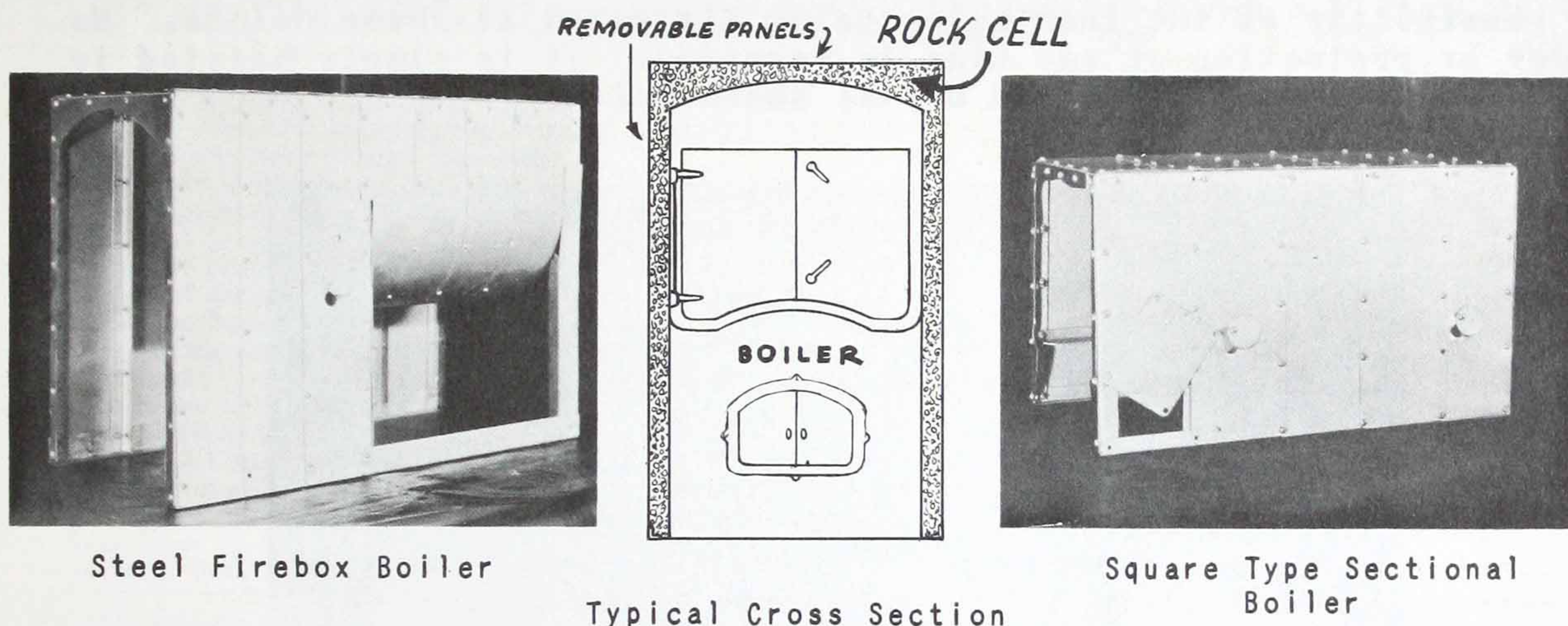
ROCK CELL INSULATION possesses very high insulating efficiency, as attested by data furnished by Prof. J. C. Peebles of The Armour Institute of Technology.

Size of Sample Inches	Thickness Inches	Density Lbs.Cu.Ft.	Mesh	Mean Temp. Deg.Fah.	Heat Conductivity "K"
16-1/2x16-1/2	2.0	27.7	Passing 1/2" Held on 1/4"	75	0.55

ROCK CELL INSULATION provides an efficient, economical and permanent solution of a number of insulating problems.

ROCK CELL BOILER INSULATION

The ROCK CELL system of insulating boilers provides a permanent insulating structure of copper alloy galvanized sheets, in panels, supported by a substantial frame of angle irons. It is firmly fastened to the floor at the proper distance from the boiler for the required thickness of insulation. ROCK CELL INSULATION is then placed between the containing panel structure and the boiler and brought flush with the top of the framework, as shown. Openings are provided for access to hand holes, grates, water outlets, etc. This provides a continuous blanket of insulation that covers the entire boiler area to be insulated - no joints - no seams - complete insulation. The outside structure of closely fitted metal reduces air leaks to the minimum, especially when pressure is high.



The panels are removable and the entire structure may be dismantled and re-assembled at any time, and the insulation re-used.

Due to the comparatively low cost of producing ROCK CELL INSULATION it does not have to be used sparingly but enough insulation can be installed to practically eliminate heat losses.

The work of installing ROCK CELL INSULATION can be done any time with the average steam plant in normal operation. A reduction in pressure of large plants is all that is sometimes necessary. ROCK CELL INSULATION does not deteriorate in any way and can be removed and used again at any time. Water - heat - cold, etc., do not change its nature or structure. It is permanent insulation.

The ROCK CELL method of insulation is also applicable to lehrs, annealing and cooling tunnels, and for any surface to be insulated that permits a retaining structure to be erected adjacent to it. ROCK CELL INSULATION has a fusion point of 2325° making it adaptable as insulation in a very wide range of temperature.

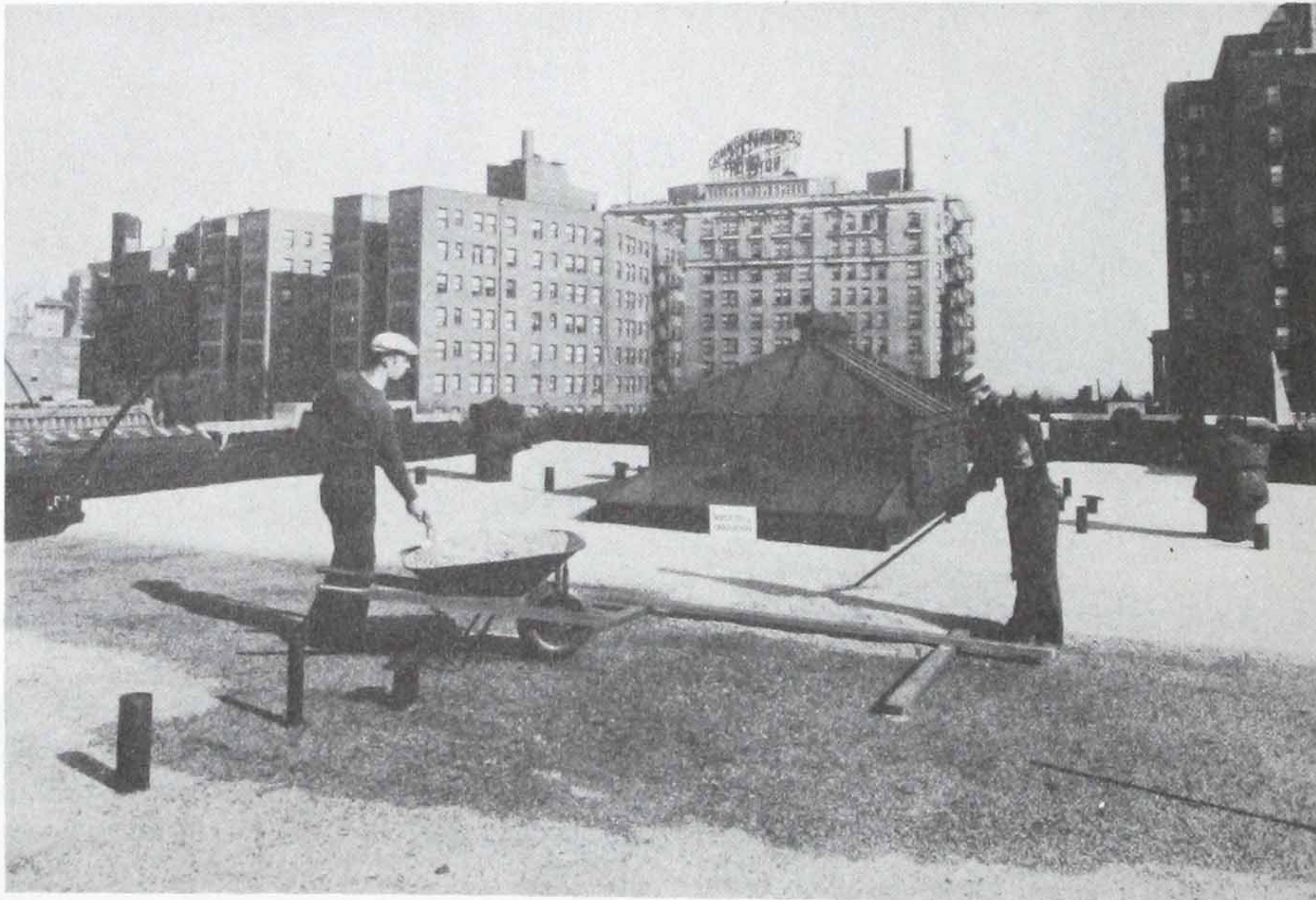
An estimate covering the moderate cost of ROCK CELL permanent insulation installed complete will be furnished on request.

ROCK CELL ROOF INSULATION

The problem of the proper insulation of the top floors of apartment houses, at a moderate cost, has never been solved until the development of ROCK CELL INSULATION. High initial cost and impermanence have been eliminated with this material. Heat discomfort in summer - Heat losses in winter - The greater proportion of rent losses on top floor apartments - combine to produce a condition that is costly to the owner. We have set forth in the following a practical solution of this problem.

ROCK CELL INSULATION is particularly adapted to the insulation of flat or relatively flat roofs of buildings of this type. It is installed in the following manner:

A layer of ROCK CELL INSULATION, between 1/4" mesh and 1/2" mesh, is spread in a uniform layer on the existing surface of the roof and lightly tamped in place to a final thickness of two inches. A galvanized wire screen is placed around drains and at the gutters to prevent any possibility of the insulation being disturbed at these points. No binder or protection of any kind is required. It is simply hoisted to the roof and spread loose and dry as shown below.



ROCK CELL being applied to a large Chicago apartment building.

When applied in this manner ROCK CELL INSULATION will remain undisturbed and unimpaired for an indefinite period. Wind-rain-sleet-freezing or any other weather condition does not affect it or impair its efficiency. The interlocking nature of the material prevents any disturbance by wind. It offers practically no resistance to drainage. Its cell structure prevents freezing, other than a thin layer on top. It possesses enough mechanical strength, in this size, to permit a moderate amount of walking on it without harm. Where frequent access to some particular area of the roof is desired a plank laid directly on the insulation is ample protection.

The high insulating efficiency and money saving of ROCK CELL INSULATION applied in this manner is shown by the following analysis of a representative building by Prof. J. C. Peebles of The Armour Institute of Technology

RESEARCH FOUNDATION OF ARMOUR INSTITUTE OF TECHNOLOGY

Thirty-third, Federal and Dearborn Streets

CHICAGO

February 1, 1938

Rock Cell Insulation Co.
105 West Madison Street
Chicago, Illinois

Gentlemen:

In the figures below we present the results obtained from estimates which we have made to determine the amount of fuel saving which may be expected when the roof of a typical apartment building is insulated with Rock Cell Insulation. Details of our calculations are as follows:

Calculations for Heat Losses through Apartment House Roof

Assume a 3-story court type of apartment building containing twenty-four apartments and having 8,000 square feet of roof. The roof construction is a 1" wood deck applied to the roof rafters and covered with tar and gravel roofing. The insulation consists of 2" of Rock Cell Insulation applied over the outer surface of the roof. The top floor ceiling consists of wood lath and plaster applied to lower face of ceiling joists.

	<u>Uninsulated Roof</u>	<u>Insulated Roof</u>
Heat Transmission Coefficient for Roof	0.49	0.176
Mean Top Floor Temperature; deg. Fah.	70	70
Mean Outdoor Temperature; deg. Fah.	34	34
Mean Attic Temperature; deg. Fah.	54	62
Mean Temperature Drop through Roof; deg. Fah.	20	28
Unit Heat Loss through Roof; Btu's per hour	9.8	4.93
Length of Heating Season; days	210	210
Length of Heating Season; hours	5040	5040
Heat Loss During Heating Season through 8,000 sq.ft. of roof; Btu's	395,136,000	198,777,600
Heat Saving due to Insulation; Btu's	196,358,400; approx. 50%	
Coal Used	Pocahontas	
Heat Value of Coal; Btu's per pound	15,000	
Cost of Coal; dollars per ton	8.00	
Overall Efficiency of Heating Plant; per cent	50	
Net Heat Usefully Used; Btu's per pound of coal	7,500	
Coal Saved by Roof Insulation; pounds	26,181	
Coal Saved by Roof Insulation; tons	13.09	
Value of Coal Saved	\$104.72	

The calculations presented above show the fuel saving which may be expected when the roof of a particular apartment building considered is covered with 2" of Rock Cell Insulation. These calculations can be made with considerable accuracy and the fuel saving can be foretold with very little error.

In addition to the fuel savings which insulation will produce, there is a further consideration which is often lost sight of. This is the effect which insulation has in producing better living conditions in the building, particularly in the top floor apartments during the hot summer weather. It is scarcely possible to carry through calculations to show the effect of insulation in reducing inside summer temperatures. This is due to the fact that these inside summer temperatures are not constant, but vary continually throughout the day, with variations in outside temperatures. However, we have presented a few calculations below which show the effect of insulation in reducing the heat flow through the roof into the building. These calculations are as follows:

Approximate Calculations for Summer

	<u>Uninsulated Roof</u>	<u>Insulated Roof</u>
Maximum Temperature of Roof; deg. Fah.	150	150
Top Floor Temperature; deg. Fah.	90	90
Corresponding Attic Temperature; deg. Fah.	116.5	103
Heat Flow into Top Floor Apartments; Btu's per hour for 8,000 sq.ft. of roof	131,520	65,750
Reduction in Heat Flow into Top Floor Apartments due to Insulation; Btu's per hour		65,770 or 50%

From the above figures it will be noted that with no insulation on the roof, the flow of heat into the building equals 131,520 Btu's per hour. Furthermore, this heat flow is reduced by almost one-half when 2" of insulation is applied to the roof. These rates of heat inflow during a hot summer day are nearly 70% greater than the rate of heat loss through the roof on an average winter day. It becomes apparent, therefore, that a really substantial amount of heat enters the building through the roof during a hot day and that this heat flow can be reduced very greatly by the use of insulation. Furthermore, the attic temperatures shown in the two cases are also indicative of the temperature conditions which may be expected on the top floor apartments.

Respectfully submitted.

RESEARCH FOUNDATION
Armour Institute of Technology

By

J. C. Peebles
J. C. Peebles

Tests made in our laboratory, where heat was applied to an ordinary 1" wood deck, showed ROCK CELL INSULATION to be very effective in reducing the inside or room temperature. With an outside temperature of 165° applied for four hours, the inside temperature was 84° with 2" of ROCK CELL INSULATION and 114° without insulation. The laboratory temperature was 75° during this test. This difference of 30° shows conclusively that the use of ROCK CELL INSULATION would greatly reduce discomfort in summer from heat through the roof, even at very high temperatures.

ROCK CELL INSULATION, under actual service conditions, has shown that it practically eliminates heat transfer through the roof structure. Comparative temperature readings made during the hottest weather in August 1938, proved its high insulating efficiency. The tests were made of a number of typical three story court type of apartment buildings having a roof construction of a wood deck applied to wooden rafters and covered with tar and gravel roofing. The roof of one wing of the buildings, between fire walls, was insulated with two inches of ROCK CELL INSULATION (installed in 1937) and a comparison with a like section, across the court, that had not been insulated. A two inch opening was made in the plaster of the ceilings of top floor apartments and comparative readings taken with tested mercury thermometers suspended six inches below the roof deck of each wing.

The sun temperatures during the test cycle varied from 110° to 130°. The summary of temperature readings was as follows:

Average sun temperature approx.	120°
Average temperature <u>uninsulated</u> attic chamber . . .	92.8°
Average temperature <u>insulated</u> attic chamber . . .	83.6°
Average temperature open air.	86.6°

The fact that the average temperature, during the test cycle, of the insulated attic chamber was lower than the average open air temperature shows conclusively that ROCK CELL INSULATION eliminates discomfort in summer from heat through the roof.

Additional advantages of ROCK CELL INSULATION.

In the opinion of roofing experts and maintenance engineers the application of two inches of ROCK CELL INSULATION to the ordinary tar and gravel roof, when new, would prolong its life indefinitely by eliminating the destructive effects of sun, wind, rain, etc., which cause the rapid deterioration of this type of roof. A proportionate saving would be effected on a roof that had been in service some time provided it was in good condition when the insulation was applied.

Real Estate Management and Renting Agents estimate that the elimination of hot weather discomfort and improved heating in winter would make the top floor apartments more desirable and increase their rental value at least \$2.50 per month per apartment. It would also decrease the turnover of tenant occupancy thereby lowering rent losses, decorating costs, and leasing fees.

A summary of actual money saving based on an analysis of a typical three story court type building of twenty four apartments, having a roof area of approximately 8,000 sq. ft., would be as follows:

Saving in coal consumption	\$104.72
Doubling the life of an ordinary tar and gravel roof costing 7¢ per sq.ft., or \$560.00, an average saving per year of.	56.00
Increased rental value of eight third floor apartments of \$2.50 per mo., or \$30.00 per year	240.00
Estimated savings by reduction in rental losses, decorating and leasing fees, \$15.00 per apt. a yr.	120.00
TOTAL ESTIMATED SAVING ONE YEAR.	\$520.72

This saving of \$520.72 in one year would be more than the complete cost of ROCK CELL INSULATION, installed, for the entire roof of this building and would mean that the many benefits of its insulation would be enjoyed, after the first year, without cost during its long life. We believe we have been conservative in compiling this estimate and that the saving in costs will be greater than shown. There are many other advantages of having the roof insulated with ROCK CELL INSULATION - better fire protection - attracts and holds tenants - an insulated building is up-to-date.

ROCK CELL INSULATION

Low in Cost

Indestructible

Waterproof

Fireproof

Proven Efficiency

**50% More Permanent Insulation at
No Additional Cost**



Call State 4336 for Estimates or Further Information



ROCK CELL INSULATION COMPANY

**105 West Madison Street
CHICAGO, ILLINOIS**

